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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/724,276	11/28/2000	Howard Turner	SMX 3099.10 (98-14CIP3DIV)	7560
321	7590	06/02/2004	EXAMINER	
SENNIGER POWERS LEAVITT AND ROEDEL ONE METROPOLITAN SQUARE 16TH FLOOR ST LOUIS, MO 63102			SODERQUIST, ARLEN	
			ART UNIT	PAPER NUMBER
			1743	

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/724,276

Applicant(s)

TURNER ET AL.

Examiner

Arlen Soderquist

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 163-209 and 211-234 is/are pending in the application.
- 4a) Of the above claim(s) 233 and 234 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 163-209 and 211-232 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2-25-04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. Newly submitted claims 233-234 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: whether one discards a stirrer after a single use or reuses it is not a proper limitation for an apparatus since it is the decision of the user and not a structural feature of the device. Thus, one could use the apparatus of claim 163 for a materially different process in which a stirrer that applicant might classify as disposable is reused or in a method in which the stirring is not simultaneous but sequential.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 233-234 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

2. Applicant is advised that should claims 171-172, 174-175 and 211-214 be found allowable, claims 193-196, 216-217 and 219-220 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Relative to claims 171-172, 174-175 and 193-196, the differences of the preamble do not limit the identical positively recited elements of the respective claimed stirrers. Relative to the other claims, examiner's inclusion of them is based on the indefiniteness of what constitutes a structural limitation of disposability since the decision to dispose or reuse the stirrer may be independent of the intended manner of use of the stirrer.

3. The amendment filed February 25, 2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material not supported by the original disclosure is as follows: the "a plastic core consisting of plastic" language in both paragraphs added to the specification. Examiner points to page 52, lines 6-19 which discuss the disposable stirrer. In particular the two sentences on lines 8-13 are particularly relevant to the discussion and are reproduced below.

"Typically, only the upper drive shaft 1400 and the coupler 1402 are made of a high modulus material such as stainless steel: the removable stirrer 1404 is made of a chemically resistant and inexpensive plastic, such as PEEK, PTFE, and the like. In contrast, one-piece spindles, though perhaps coated with PTFE, are generally made

entirely of a relatively expensive high modulus material, and are therefore normally reused."

From this it is clear that the specification is trying to distinguish the plastic of the invention from a coated shaft. However, plastics often contain filler materials for enhancing one or more properties of the plastic. An example of what is typical can be found in newly cited Ishikawa reference (US 4,985,190). Relevant portions of column 1 lines 8-63 are reproduced below.

"Polytetrafluoroethylene (hereinafter sometimes referred to simply as PTFE) has an extremely high viscosity even when heated to a temperature over the melting point, and is usually hardly moldable by melt extrusion molding. PTFE has excellent heat resistance, chemical resistance, electrical properties and lubricating properties, but it has a drawback that the mechanical strength is low. Therefore, it is common to reinforce PTFE by an addition of glass fibers, graphite, bronze, carbon fibers or other inorganic powders or fibers. To obtain tubes, rods or sheets of such filler-containing PTFE, methods disclosed in e.g. Japanese Examined Patent Publication No. 54578/1986, Japanese Unexamined Patent Publication No. 34661/1975 and the reference material of ICI Company for the molding technique of Fluon PTFE fine powder, are employed for molding." (lines 8-23)

"The content of the filler in such conventional filler-containing PTFE was from 0 to 30% by volume." (lines 38-39)

"On the other hand, in a product which usually contains no PTFE such as food products or building materials, it is known to incorporate PTFE in an amount of from 1 to 2% by weight for the purpose of improving the surface smoothness of the extruded product. (lines 56-63)

From this it is clear to see that the term plastic includes filler containing plastics. Because of the range of filler material that appears to be typical, the plastic materials do not appear to be equivalent to the plastic coated stirrers that the specification clearly distinguishes. Therefore either the amendment to the specification introduces new matter or a filler containing plastic material as disclosed by Ishikawa is within the scope of the "a plastic core consisting of plastic" language added to the specification

Applicant is required to cancel the new matter in the reply to this Office Action.

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claims 211-214, 216-221, 223-225 and 227-232 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Each of these claims contain the "a plastic core consisting of plastic" language of the specification objected to above. As noted above it is clear that the specification distinguishes between a high modulus core material such as stainless steel with a coating of plastic (the stirrer is almost entirely made of the high modulus material) and a stirrer made of a plastic such as PEEK or PTFE. This does not provide basis for excluding plastics containing filler material such as the PTFE materials described by Ishikawa. Thus, for examination purposes of these claims, a filler containing plastic such as taught by Ishikawa will be treated as within the scope of the consisting language.

6. Claims 163-209 and 215-232 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In these claims it is not clear what structural limitation constitutes a "single use plastic stirrer". This is because whether a plastic stirrer is use a single time or multiple times before being discarded is not necessarily related to its intended number of times the stirrer may have been designed for use before disposal. For examination purposes a plastic stirrer will be treated as meeting the limitation.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. Claims 171-175, 193-196, 213, 219, 221, 230 and 232 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aldrich in view of Rutkowski (newly cited and applied) or Salzman and optionally in view of Strah or alternatively Rutkowski in view of Aldrich and optionally Strah. In the pages of the Aldrich catalog, stirring equipment is described which anticipates the claimed stirring mechanism. This includes Teflon® coated stirring rods (pages 2108-2109) and a quick-disconnect chuck design. Aldrich does not teach a stirring shaft/mixing blade made without a metal core in the shaft or the specific structure of the quick-disconnect chuck.

In the paper Rutkowski examines the effect of stirring on the reduction current in constant potential coulometry. The effect of the shape and material of the stirrer, the depth of immersion, and rate and constancy of revolution on the initial current (i_0) was investigated by using the reduction of U(VI) to U(IV) on a Hg electrode as an example. The best results were obtained by using a cylindrical Teflon stirrer with vertical cuts; in this case i_0 depended little on the depth of immersion or rate of revolution. Intensive and correct stirring of the solution can significantly decrease the time in coulometric analysis and improve the precision and accuracy of the determination. Figure 1 shows the setup including reaction vessel and stirring mechanism. Figure 3 shows that various stirrers used. Examiner is not able to determine if a quick connect/disconnect element is present.

In the paper Salzman presents dynamic mixers turn more to glass fiber reinforced plastics. The use of reinforced plastics in mixers as impellers and shafts is discussed. The principal force for using reinforced plastics is the cost advantage. The A6000 impeller produces more flow/h than any other mixing impeller; the A410 is tailored to perform efficiently over a wide range of fluid viscosities. Figure 6 shows and discusses a stirrer that has a metal shaft and blade (impeller) replaced by the reinforced plastics and states that there are no restrictive mechanical design considerations involved in the use of the plastics.

In the patent Strah teaches a single hand manipulatable quick-connect-disconnect fluid line coupler with female body portion and a male connector portion attachable to respective line ends by integral fittings. The body is proportioned for manual grasping with two-finger

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manipulatability of a slidable actuating sleeve; and the body slot convergency and the disposition therein of parallel locking pins engageable with a male portion circumferential locking groove are so related and a simple seal structure provided so as to afford a firm sealed lock under high pressure while facilitating manual actuation in a low-cost structure. In the first paragraph Strah teaches that various types of quick-connect, quick-disconnect type fluid line couplers are known to the prior art wherein a male element on one line end is sealingly received in a female body component on the other line end and thereto locked by various latching devices such as detent spring elements, catches, spring-biased detent balls; some of these being actuated by a sliding sleeve camming the elements or releasing the elements performing the locking function with respect to a groove on the received male connector end; and as well by various bayonet locking systems.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the fiber reinforced materials of Salzman or the Teflon Stirrer structures of Rutkowski in the stirring apparatus of Aldrich because of the cost advantage associated with using the reinforced materials compared to metals as taught by Salzman. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a notoriously well known quick-disconnect coupling mechanism such as an annular groove or a bayonet system as taught by Strah in the quick-disconnect chuck design of Aldrich for the known advantages or the cost as taught by Strah. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a notoriously well known quick-disconnect coupling mechanism such as the quick-disconnect chuck design of Aldrich or an annular groove or a bayonet system as taught by Strah in the Rutkowski apparatus for the known advantages or the cost as taught by Strah. Relative to the size of an article, the Court in *In re Rose*, 105 USPQ 237 (CCPA 1955) held that the size of an article is not a matter of invention.

9. Claims 214, 220 and 231 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aldrich in view of Rutkowski or Salzman and optionally in view of Strah or alternatively Rutkowski in view of Aldrich and optionally Strah as applied to claims 213, 219 or 230 above, and further in view of Iio (JP 6-42302, newly cited and applied). Aldrich and Rutkowski do not teach the stirrer made of polyether ether ketone (PEEK).

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In the published application Iio teaches an integral type fiber reinforced resin-made impeller having properties that satisfying collision resistance against foreign matter, blade part rigidity, compression creep characteristic, compression strength, etc., required for the integral type fiber reinforced resin-made impeller. The integral type fiber reinforced resin-made impeller 1 is molded by using singly a carbon long fiber reinforced resin pellet or a mixed material at least contained therewith, so that a mean carbon fiber content of this fiber reinforced resin-made impeller obtains 20 to 40wt.% in the case that matrix resin is polyether ether ketone resin, polyether ketone resin, blend resin of polyether ketone/polyether imide, polyether nitrile resin and 25 to 40wt.% in the case that the matrix resin is polyether imide resin, polyether sulfone resin, polyamideimide resin.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the PEEK material of Iio in the stirrer of Aldrich or Rutkowski because of its ability to satisfying collision resistance against foreign matter, blade part rigidity, compression creep characteristic and compression strength required for an impeller

10. Claims 163-170, 176-192, 197-209, 211-212, 215-218 and 222-229 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelles in view of Lebl, Corkan and Salvat or Conrad (newly cited and applied) and Aldrich, Rutkowski, Iio, Salzman or Strah as explained above. In the paper Nelles presents the development of experimental reactors for heterogeneous solid-liquid processes. A laboratory research installation consists of a measuring vessel for the main reactant, a charging vessel (for feeding a definite amount of the main reactant), a reactor, 2 thermostats, and a magnetic, multipath valve for selecting one or the other of the thermostat liquids, which have different temperatures. The reactor is a vertical cylindrical jacketed pressure vessel (volume 2 liters, 20 atmospheres), fitted with a samples mounted in the bottom and a stirring mechanism mounted in the top. The stirrer is a combination of an anchor (open toward the bottom) and a helix that wipes the wall. The stirrer rpm is 85-2100. Details of the reactor, stirring mechanism, and sampling device are presented in diagrams. Samples can be taken during the reaction under pressure. The apparatus is suitable for heterogeneous polymerization and precipitation reactions. Nelles does not teach a plurality of reactors, a magnetic drive for the stirring means or specifics of a multi-piece stirrer.

In the patent Lebl teaches apparatus and method for combinatorial chemistry synthesis. In a first embodiment, this invention includes an integrated robot apparatus for performing combinatorial chemical synthesis protocols and having interchangeable work-stations, robot arm tools, and reaction vessels and reaction vessel arrays. The work-stations and tools are specialized to perform tasks necessary for the synthesis in a plurality of the reaction vessels grouped in a plurality of the reaction vessel arrays. Preferably, these elements function interchangeably because they have standardized sizes and conformation. The work-stations and tools include those for fluid dispensing or aspirating from individual reaction vessels or from all the reaction vessels in an array simultaneously. The reaction vessels can include, alternatively, stackable, ball-sealed reaction vessels, microtitre-like reaction vessel arrays, arrays of independent reaction vessels, valve-sealed reaction vessels (figures 8-11 and the description thereof for the disclosure), septum-sealed reaction vessels, and syringe reaction vessels. In particular figure 8A shows a reaction block having a common plate (211) on top of the reaction vessels (213) which includes holes (216) for access to the interior of the reaction vessels. In alternative embodiments, this invention includes these work-stations, tools, reaction vessels and reaction vessel arrays in various combinations or sub-combinations either for use in partially integrated robots or for manual or stand-alone use.

In the paper Corkan discusses an automation system with the ability to work relentlessly, precisely, strategically, and autonomously in pursuit of scientific goals. Some years' work has been aimed at developing the hardware and software architecture for an automated workstation. The workstation is designed for microscale experimentation in relatively clean domains of synthetic chemistry. The workstation is shown in figure 2 and includes robotic and a stirring assembly for multiple samples. The stirring assembly can heat/cool the samples individually. A schematic of the software system and how it is used to control the device is presented in figure 3. The paper also describes the approaches to performing experiments in parallel. Parallelism originates chiefly through simultaneous processing of samples at semi-autonomous hardware modules, at the user interface, and through the use of a scheduler. Experimental throughput can be increased by up to ten-fold by this approach.

In the abstract of the Salvat patent publication, a device for stirring a reactor contains a shaft which is connected to a drive by means of a magnetic clutch. Both clutch magnets are

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mounted against each other perpendicularly to the rotation axis (i.e., the magnet attached to the motor shaft is placed outside the reactor and the magnet attached to the stirrer is placed inside the reactor). The reactor vessel is completely tight.

In the paper Conrad teaches a Teflon stirrer for mixing in cuvettes. Relative to the instant claims is the presence of a magnet in a hole in the stirrer that allows the stirrer to spin under the influence of a magnetic stirring drive mechanism.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide multiple Nelles reaction vessels as taught by Corkan and Lebl including a common cover (plate) as taught by Lebl because of the ability to automate the process or the ability to increase the rate at which information on the synthetic processes are gathered as taught by Corkan and Lebl and the simultaneous control of access to the reaction vessels as taught by Lebl. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a drive mechanism as taught by Salvat, Conrad or Aldrich and the stirring paddles taught by Aldrich, Rutkowski or Salzman in the Nelles reactor because of the ability to agitate the reactor contents without exposing worry of escape of the contents due to a failed seal, the ability to change the stirring paddles depending on the needs of the system being agitated and the cost of plastic materials as taught by Aldrich, Salvat and Salzman. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a head construction as taught by Lebl for the Nelles reactor because of its ability to allow injection of materials into the reactor.

11. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Some comments need to be made since not all rejections are new. Relative to the objection under 37 CFR 175 examiner notes that the structure related to the drive mechanism and spindles are not positively recited as limitations of the stirrer nor can examiner see any reason that they would lead to any difference in the structure. This is because the claims do not limit or prevent additional structure that would be used to adapt the a stirrer designed for the spindle to fit into another type of drive mechanism. As a real example, the claims do not prevent the use of an adapter to add a magnet onto the Rutkowski stirrer to allow it to be driven by a magnet rather than a spindle. Likewise the Conrad stirrer could have an adapter with magnet that would allow it to be rotated by the spindle of Rutkowski. Thus the

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claims are of the same scope. Relative to the single use limitation, the manner in which a stirrer is used does not directly depend on its structure. For example, a stirrer may have recommended use parameters such as speed or solution viscosity, but the actual use parameters can be outside of these depending on the needs of the user. In the same way there could be situations in which a disposable (i.e. designed to be cheap) stirrer would be used multiple times. Thus "single use plastic stirrer" does not define over the art of record. Additionally the newly cited and applied Rutkowski reference appears to be of a construction that appears to meet the consisting of language of the new claims and would therefore qualify as stirrers made from an inexpensive material as discussed on page 52, lines 6-19 of the instant application. Relative to the spinning speed examiner points out that the limitation is "up to 3000 rpm" and that there are various speeds for the mixers in the Aldrich reference. In particular the Model TSR-1516TM found on page 2099 has a range of 0-5000 rpm and therefore covers the range of the claim. Relative to the claims directed solely to the stirrer, the presence of a filler in plastic is common as shown by the Ishikawa reference. Its presence can vary as taught by the reference. Thus it appears that a filler containing plastic is still considered a plastic by the art. Additionally it is clear that the filler does not make up the major portion of the plastic and so it is different from the coated metal stirrer that applicant distinguishes on page 52 of the instant specification. It appears that applicant is trying to exclude any sort of filler from the plastic which, as explained above, the instant disclosure does not support. Relative to the size of an article, the Court in *In re Rose*, 105 USPQ 237 (CCPA 1955) held that the size of an article is not a matter of invention.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additionally cited art relates to the use of fillers in plastic and stirrers or impellers. The Rutkowski reference has been submitted for translation.

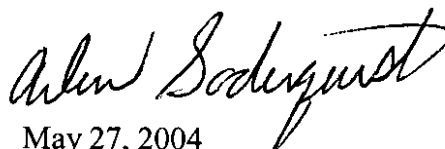
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose current telephone number is (571) 272-1265 as a result of the examiner moving to the new USPTO location. The examiner's schedule is variable between the hours of about 5:30 AM to about 5:00 PM on Monday through Thursday and alternate Fridays.

A general phone number for the organization to which this application is assigned is (571) 272-1700. The fax phone number to file official papers for this application or proceeding is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, reading "Arlen Soderquist". The signature is fluid and cursive, with the first name "Arlen" and last name "Soderquist" clearly distinguishable.

May 27, 2004
ARLEN SODERQUIST
PRIMARY EXAMINER